The Effectiveness of Compassion-Focused Therapy on Self-Control and Cognitive Flexibility in Opioid-Dependent Women: A Clinical Trial

Abstract

Aims: Opioid use disorder (OUD) severely impacts psychological well-being, particularly in women, highlighting the need for targeted psychological interventions. This study aimed to investigate the effectiveness of compassion-focused therapy (CFT) on self-control and cognitive flexibility in women with OUD.

Materials & Methods: This clinical trial was conducted in 2025 among treatment-seeking women in Ahvaz, Iran. Using convenience sampling, 30 eligible women were selected and randomly assigned to experimental and control groups (n=15/group). The experimental group received eight 90-minute CFT sessions, while the control group received no additional intervention during this period. Data were collected using the Brief Self-Control Scale and the Cognitive Flexibility Inventory. Data were analyzed using a mixed-design ANOVA with repeated measures and Bonferroni post-hoc tests.

Findings: The findings demonstrated a significant difference between the two groups post-intervention. Specifically, the implementation of CFT significantly enhanced self-control and cognitive flexibility in the experimental group compared to the control group ($P<0.001$).

Conclusion: CFT is a highly efficacious psychological intervention for enhancing self-regulation and cognitive adaptability in women with OUD. Integrating this therapy into addiction rehabilitation programs is highly recommended.

Keywords: Opioid-related disorders, Compassion, Self-control, Cognitive flexibility, Psychotherapy

Introduction

Opioid Use Disorder (OUD) represents a profound global health crisis, characterized by compulsive drug-seeking behavior despite catastrophic personal and social consequences [1]. While OUD affects both sexes, women grappling with opioid dependence face a unique and multifaceted set of biopsychosocial challenges. Research indicates that women often experience a "telescoping effect," wherein the progression from initial substance use to severe psychosocial impairment occurs significantly more rapidly than in men [2]. Furthermore, women with OUD frequently present with higher rates of co-occurring psychiatric conditions, including severe trauma, depression, and anxiety, which are often compounded by intense societal stigma and profound internal shame [3]. These intertwined emotional and structural barriers severely complicate their recovery trajectory, leading to higher attrition rates in standard treatment programs and increased vulnerability to relapse. Addressing the specific psychological deficits that precipitate and maintain addictive behaviors in this marginalized population is thus of paramount clinical importance [4].

A central psychological deficit in the pathogenesis and maintenance of OUD is diminished self-control. Self-control is broadly defined as the capacity to override prepotent impulses, regulate intense emotions, and delay immediate gratification in pursuit of long-term, goal-directed outcomes [5]. In the context of addiction, the chronic use of opioids disrupts the brain's executive control networks, rendering individuals highly susceptible to craving and impulsive drug-seeking under stress [6]. For women with OUD, impaired self-regulation often translates into an inability to manage negative affective states without resorting to substance use as a maladaptive coping mechanism. Consequently, enhancing self-control is not merely about behavioral restriction; rather, it is about rebuilding the foundational psychological architecture necessary to resist triggers, manage emotional dysregulation, and sustain long-term abstinence [7].

In tandem with self-control, cognitive flexibility serves as a critical executive function that is heavily compromised in individuals with opioid dependence. Cognitive flexibility refers to the mental agility required to adapt one's thinking and behavior in response to changing environmental demands or shifting contingencies [8]. Women with OUD frequently exhibit heightened cognitive rigidity, often manifesting as an inability to generate alternative solutions to interpersonal problems or a tendency to become perseveratively stuck in negative, self-defeating thought loops [9]. This psychological inflexibility strongly correlates with continued substance use, as individuals struggle to transition from entrenched addictive habits to novel, adaptive recovery behaviors. Cultivating cognitive

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flexibility is therefore essential, as it empowers patients to re-evaluate maladaptive beliefs, adapt to the dynamic challenges of rehabilitation, and actively engage in alternative coping strategies [10].

To address these complex psychological vulnerabilities, Compassion-Focused Therapy (CFT) has emerged as a highly promising psychological intervention. Developed initially to treat individuals with high levels of shame and self-criticism—traits markedly prevalent among women with addiction—CFT targets the brain's affect regulation systems [11]. The therapy focuses on stimulating the soothing-affiliative system to counteract the hyperactive threat-protection system, which is often dominant in traumatized and addicted populations [12, 13]. By cultivating self-compassion, individuals learn to relate to their own suffering, failures, and cravings with warmth and nonjudgmental understanding rather than punitive self-criticism. This compassionate self-stance creates a safe psychological environment, reducing the distress-induced drive to use opioids and providing the emotional bandwidth necessary to practice self-regulation and adaptive thinking [14].

A growing body of empirical literature supports the efficacy of CFT and related psychological interventions in mitigating addiction-related deficits. For instance, recent studies have demonstrated the positive impact of psychotherapeutic protocols on enhancing self-control among women with substance use issues [15]. Furthermore, interventions rooted in compassion have proven effective in modifying cognitive flexibility and reducing self-criticism in vulnerable adult populations [16]. Specific research utilizing CFT has also shown significant improvements in psychological flexibility and self-control across various clinical populations [17]. However, despite these promising findings, there remains a notable dearth of research examining the integrated effects of CFT on both self-control and cognitive flexibility, specifically tailored to the unique clinical profile of women diagnosed with OUD [18].

Given the severe societal and personal impact of OUD in women, alongside the limitations of purely pharmacological treatments, multidimensional psychological interventions are crucial. Women with OUD require therapeutic frameworks that not only target behavioral cessation but also heal underlying shame, thereby facilitating durable structural changes in self-regulation and cognitive adaptability [19]. Addressing this gap is necessary to optimize rehabilitation protocols and provide evidence-based, compassionate care for this highly vulnerable population. Therefore, the present study aimed to investigate the effectiveness of Compassion-Focused Therapy on self-control and cognitive flexibility in opioid-dependent women.

Materials and Methods

Design and Participants

This study was conducted as a clinical trial with a pre-test/post-test control group design to evaluate the efficacy of CFT. The statistical population comprised all women diagnosed with OUD who were receiving care at addiction treatment centers in Ahvaz, Iran, during 2025. A sample of 30 women was selected using convenience sampling based on accessibility and voluntary willingness to participate. Participants were then randomly assigned to either the experimental group (n=15), which received CFT, or the control group (n=15), which received treatment as usual (TAU). Inclusion criteria were: (1) a formal diagnosis of OUD according to DSM-5 criteria, (2) age between 18 and 50 years, (3) provision of written informed consent, and (4) at least primary-level literacy. Exclusion criteria were: (1) diagnosis of a severe co-occurring psychiatric disorder (e.g., psychotic or bipolar disorders), (2) acute or severe physical illness, and (3) concurrent participation in other structured psychological interventions. The study protocol was approved by the Institutional Review Board of Islamic Azad University. All participants were assured of data confidentiality and their right to withdraw from the study at any time without penalty.

Procedure

Following ethical approval, the researchers coordinated with the directors of several addiction treatment centers in Ahvaz. Potential participants were identified and approached by the research team, who provided a comprehensive overview of the study's objectives and procedures. Women who expressed interest were screened against the inclusion and exclusion criteria. Eligible participants provided written informed consent. All 30 participants then completed the pre-test battery, which included the Brief Self-Control Scale (BSCS) and the Cognitive Flexibility Inventory (CFI). After pre-test data collection, participants were randomly allocated to the experimental or control group. The experimental group attended eight sessions of CFT, while the control group continued with treatment as usual. Immediately after the intervention period, all participants completed the post-test questionnaires.

Research Instruments

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Brief Self-Control Scale (BSCS): The BSCS, developed by Tangney et al. [20], was used to measure dispositional self-control. This self-report instrument consists of 13 items rated on a 5-point Likert scale, ranging from 1 (Not at all like me) to 5 (Very much like me). Total scores range from 13 to 65, with higher scores indicating greater self-control. The scale has demonstrated strong psychometric properties in previous studies. In the Persian validation, Cronbach's alpha was reported as 0.83 [21]. In the present study, Cronbach's alpha for the BSCS was 0.87.

Cognitive Flexibility Inventory (CFI): The CFI, developed by Dennis and Vander Wal [22], is a 20-item self-report measure designed to assess cognitive flexibility, specifically the ability to challenge and replace maladaptive thoughts with more balanced ones. The inventory comprises two subscales: "Alternatives" (ability to generate multiple alternative explanations for life events) and "Control" (perception of difficult situations as controllable). Items are rated on a 7-point Likert scale from 1 (Strongly Disagree) to 7 (Strongly Agree). Total scores range from 20 to 140, with higher scores indicating greater cognitive flexibility. The Persian version of the CFI has shown excellent reliability, with a Cronbach's alpha of 0.90 [23]. In the present study, Cronbach's alpha was 0.92.

Intervention Program

Participants in the experimental group received a structured CFT intervention delivered in eight 90-minute weekly group sessions. The program was adapted from the model developed by Paul Gilbert [9] and focused on psychoeducation regarding the three affect regulation systems, cultivating a compassionate self, and developing skills to manage distressing thoughts and feelings without self-criticism. The control group received treatment as usual (TAU), consisting of routine addiction counseling and, where applicable, methadone maintenance therapy. An overview of the CFT sessions is presented in Table 1.

Table 1. Summary of Compassion-Focused Therapy (CFT) Session Content

Session	Topic	Key Objectives and Activities
1	Introduction and Psychoeducation	Introduction to CFT, explaining the "tricky brain" and the three affect regulation systems (threat, drive, soothing).
2	Understanding Compassion	Defining compassion; exploring the attributes of compassion (e.g., wisdom, strength, non-judgment) and its three flows.
3	Developing the Compassionate Self	Introducing the concept of the "compassionate self"; using imagery and mindfulness exercises to cultivate a compassionate mindset.
4	Compassionate Attention and Mindfulness	Training attention to focus on the present moment with a compassionate attitude; soothing rhythm breathing exercises.
5	Working with Self-Criticism	Identifying self-critical thoughts; understanding their function from a threat-system perspective; reframing with compassion.
6	Compassionate Behavior and Action	Translating compassionate feelings into concrete actions; planning self-soothing and supportive behaviors.
7	Managing Difficult Emotions and Shame	Applying compassionate skills to shame and addiction-related distress; developing a non-judgmental stance toward cravings.
8	Consolidating Skills and Future Planning	Reviewing learned concepts; creating a personal plan for continuing compassionate practice post-therapy; relapse prevention.

Data Analysis

All statistical analyses were performed using SPSS software, version 26. Descriptive statistics (means and standard deviations) were calculated for demographic variables and primary outcome measures at pre-test and post-test. To test the study hypotheses, a mixed-design Analysis of Variance (ANOVA) with repeated measures was conducted for each dependent variable (self-control and cognitive flexibility). The within-subjects factor was time (pre-test vs. post-test), and the between-subjects factor was group (experimental vs. control). Bonferroni post-hoc tests were used for pairwise comparisons when significant interaction effects emerged. A p-value of less than 0.05 was considered statistically significant.

Findings

The two groups were comparable in terms of demographic characteristics at baseline. The mean age of participants in the experimental (CFT) group was 34.8 years (SD=8.1), while the mean age in the

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control group was 35.1 years (SD=7.2). Regarding educational level, in the CFT group, 7 participants (46.7%) had completed high school education and 8 participants (53.3%) held university-level qualifications. In the control group, 8 participants (53.3%) had high school education and 7 participants (46.7%) possessed university education.

As shown in Table 2, the experimental and control groups had nearly identical baseline (pre-test) scores on both self-control and cognitive flexibility, indicating successful randomization. Following the intervention, the CFT group demonstrated substantial improvement in self-control scores, increasing from a pre-test mean of 26.66 (SD=8.09) to 42.20 (SD=7.03) at post-test, with scores remaining relatively stable at follow-up (M=40.93, SD=6.95). In contrast, the control group showed minimal change across all three time points. A similar pattern was observed for cognitive flexibility, where the CFT group improved markedly from a pre-test mean of 49.53 (SD=16.22) to 72.60 (SD=16.08) at post-test, while the control group remained essentially unchanged.

Table 2. Descriptive statistics for self-control and cognitive flexibility scores across time points by group

Variable	Group	Pretest Mean ± SD	Posttest Mean ± SD	Follow-up Mean ± SD
Self-control	CFT group	26.66±8.09	42.20±7.03	40.93±6.95
	Control group	26.86±6.85	27.75±6.86	27.98±6.71
Cognitive flexibility	CFT group	49.53±16.22	72.60±16.08	71.53±16.07
	Control group	48.14±15.37	48.22±15.19	49.73±14.17

SD: Standard Deviation; CFT: Compassion-Focused Therapy

Prior to conducting the mixed-design ANOVA, the assumptions of normality (assessed via Shapiro-Wilk test), homogeneity of variances (Levene's test), and sphericity (Mauchly's test) were examined. All assumptions were satisfactorily met (P> 005). The results of the mixed-design ANOVA (Table 3) revealed a statistically significant time × group interaction effect for self-control, F=54.98, P<0.001, η^2=0.66, indicating a large effect size. Similarly, a significant time × group interaction was found for cognitive flexibility, F= 23.16, P<0.001, η^2=0.45.

Table 3. Results of Mixed-Design ANOVA

Variable	SS	df	MS	F	P	η^2
Self-control	189.75	1	189.75	54.98	0.001	0.66
Cognitive flexibility	117.22	1	117.22	23.16	0.001	0.45

SS: Sum of Squares; MS: Mean Square

Bonferroni-corrected pairwise comparisons were performed to further explore the significant interaction effects. As presented in Table 4, within the CFT group, self-control scores showed significant improvement from pre-test to post-test (MD=15.54, SE=1.85, P<0.001) and from pre-test to follow-up (MD=14.27, SE=1.92, P<0.001). The slight decrease observed between post-test and follow-up was not statistically significant (MD=-1.27, SE=0.98, P=0.612). For cognitive flexibility, significant gains were also observed from pre-test to post-test (MD=23.07, SE=3.12, P<0.001) and pre-test to follow-up (MD=22.00, SE=3.25, P<0.001), with no significant change between post-test and follow-up (MD=-1.07, SE=1.15, P=0.721). No significant changes across time points were observed in the control group (all P>0.05). Between-group comparisons at post-test and follow-up also favored the CFT group significantly (P<0.001).

Table 4. Bonferroni post-hoc comparisons for self-control and cognitive flexibility within the CFT group

Variable	Time	MD	SE	P
Self-control	Pretest – Posttest	15.54	1.85	0.001
	Pretest – Follow-up	14.27	1.92	0.001
	Posttest – Follow-up	-1.27	0.98	0.612
Cognitive flexibility	Pretest – Posttest	23.07	3.12	0.001
	Pretest – Follow-up	22.00	3.25	0.001
	Posttest – Follow-up	-1.07	1.15	0.721

MD: Mean Difference; SE: Standard Error

Discussion

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The present study demonstrated that CFT significantly enhances both self-control and cognitive flexibility among women with OUD. Beyond symptom reduction, understanding the underlying psychological mechanisms of these improvements is crucial. OUD is frequently maintained by a vicious cycle of intense psychological distress, pervasive shame, and severe self-criticism, which collectively deplete cognitive resources and impair self-regulatory capacity [1]. Individuals with OUD often resort to substance use as a maladaptive strategy to escape this internal distress. CFT directly targets this dynamic by activating the affiliative and soothing emotion regulation system [24]. By cultivating a warm, nonjudgmental, and compassionate self-stance, the therapy reduces the intense negative affect associated with shame. This emotional stabilization frees cognitive resources, thereby strengthening self-control and enabling individuals to better resist cravings and manage destructive impulses [9]. These findings align with those of a recent study [11], which showed that compassion-based interventions significantly improve impulse control and emotional regulation in populations with substance use disorders. Similarly, another study [25] found that fostering self-compassion reduces self-punitive behaviors that typically undermine self-control during addiction recovery.

Furthermore, the intervention produced substantial improvements in cognitive flexibility. Chronic opioid dependence is often characterized by cognitive rigidity and entrenched behavioral patterns, in which individuals repeatedly engage in drug-seeking behavior despite adverse consequences [26]. Key components of CFT—particularly mindfulness, decentering, and present-moment awareness—help dismantle these rigid, ruminative cognitive structures [7]. By training participants to observe distressing thoughts and physiological urges without immediate reactivity or harsh self-judgment, CFT promotes cognitive decoupling [16]. This mental flexibility allows individuals to generate alternative perspectives, move beyond dichotomous thinking, and adopt more adaptive coping strategies when facing psychosocial stressors [27]. These results are consistent with prior research [7], which indicated that reducing internal self-criticism through compassion training enhances executive functioning and facilitates adaptive shifts in cognitive sets.

The concurrent enhancement of self-control and cognitive flexibility highlights the comprehensive therapeutic value of CFT. Traditional addiction treatments often emphasize abstinence while insufficiently addressing the profound emotional dysregulation and self-criticism that perpetuate the dependency cycle [14]. By transforming the individual's internal dialogue from self-hostility to self-care, CFT establishes a resilient psychological foundation. This enables patients not only to inhibit destructive impulses but also to navigate the complex emotional demands of sustained recovery more effectively [18].

Despite these promising results, several limitations should be acknowledged. The use of convenience sampling within a specific population (women with OUD in Ahvaz, Iran) limits the generalizability of the findings to men, other cultural contexts, or different clinical settings. Additionally, reliance on self-report measures may have introduced social desirability or response biases. Future studies should employ larger, multi-center randomized controlled trials and incorporate objective behavioral or neurophysiological measures to strengthen the evidence base.

Conclusion

In conclusion, this study provides evidence for the efficacy of CFT in enhancing self-control and cognitive flexibility among women with OUD. By systematically addressing shame and self-criticism—the key emotional drivers that sustain addiction—CFT creates a stable internal environment that supports adaptive thinking and improved self-regulation. Given these benefits, it is strongly recommended that clinicians integrate compassion-based interventions into standard addiction rehabilitation programs. Such integration can promote sustained abstinence and foster the psychological resilience necessary for long-term recovery.

Ethical Considerations

The study protocol was reviewed and cleared by the Ethics Committee of Islamic Azad University (Approval ID: IR.IAU.AHVAZ.REC.1404.052).

IRCTID

The clinical trial is officially registered under the IRCT identifier IRCT20250606066093N3.

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